

Hydrogeology Department Journal Publications
February 2002 — March 2005

1. Birkholzer, J., 2003. Penetration of Liquid Fingers into Superheated Fractured Rock. *Water Resources Research*, **39**(4): pp. 1102; doi:10.1029/2002WR001464, LBNL-50042.
2. Birkholzer, J.T. and Ho, C.K., 2003. A Probabilistic Analysis of Episodic Preferential Flow Into Superheated Fractured Rock. *Journal of Hydrology*, **284**(1-4): pp. 151-173, LBNL-51893.
3. Birkholzer, J.T., Mukhopadhyay, S. and Tsang, Y., 2004. The Impact of Preferential Flow on the Vaporization Barrier Above Waste Emplacement Drifts at Yucca Mountain, Nevada. *Nuclear Technology*, **148**(2): pp. 138-150, LBNL-53893.
4. Birkholzer, J.T., Mukhopadhyay, S. and Tsang, Y.W., 2004. Modeling Seepage Into Heated Waste Emplacement Tunnels in Unsaturated Fractured Rock. *Vadose Zone Journal*, **3**: pp. 819-836, LBNL-53894.
5. Birkholzer, J.T., 2005. Estimating Liquid Fluxes in Thermally Perturbed Fractured Rock Using Measured Temperature Profiles. *Journal of Hydrology*: LBNL-57096. (Submitted 2005)
6. Birkholzer, J.T., 2004. A Temperature-Profile Method for Estimating Flow Processes in Geologic Heat Pipes. *Journal of Contaminant Hydrology*: LBNL-56716. (Submitted 2004)
7. Bodvarsson, G.S., Kwicklis, E., Shan, C. and Wu, Y.S., 2003. Estimation of Percolation Flux from Borehole Temperature Data at Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 3-22, LBNL-41866.
8. Bodvarsson, G.S., Wu, Y.-S. and Zhang, K., 2003. Development of the Discrete Flow Paths in Unsaturated Fractures at Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**(Special Issue): pp. 23-42, LBNL-49863.
9. Borglin, S., Hazen, T., Oldenburg, C. and Zawislanski, P., 2004. Comparison of Aerobic and Anaerobic Biotreatment of Municipal Solid Waste. *Journal of the Air and Waste Management Association*, **54**(7): pp. 815-822, LBNL-50576.
10. Bryant, J.A., Yogodzinski, G.M., Hall, M.L., Lewicki, J.L. and Bailey, D.G., 2004. Geochemical Constraints on the Origin of Volcanic Rocks from the Andean Northern Volcanic Zone, Ecuador. *Journal of Petrology*: LBNL-55805. (In Revision 2005)
11. Campbell, C.G., Borglin, S.E., Stringfellow, W.T., Green, F.B. and Grayson, A., 2004. Review of Bioassays for Monitoring Fate and Transport of Estrogenic Endocrine Disrupting Compounds in Water. *Critical Reviews in Environmental Science & Technology*: LBNL-56137. (Submitted 2004)

12. Campbell, C.G., Laycak, D.T., Hoppes, W., Tran, N.T. and Shi, F.G., 2004. High Concentration Suspended Sediment Measurements Using a Continuous Fiber Optic In-Stream Transmissometer. *Journal of Hydrology*: LBNL-55272. (Submitted 2004)
13. Chijimatsu, M., Nguyen, T.S., Jing, L., De Jonge, J., Kohlmeier, M., Millard, A., Rejeb, A., Rutqvist, J., Souley, M. and Sugita, Y., 2004. Numerical Study of the THM Effects on the Near-Field Safety of a Hypothetical Nuclear Waste Repository - BMT1 of the DECOVALEX III Project. Part 1: Conceptualization and Characterization of the Problems and Summary of Results. *International Journal of Rock Mechanics & Mining Sciences*: LBNL-55940. (In Press)
14. Cook, P.J., Salve, R., Freifeld, B.M. and Tsang, Y.T., 2003. A Measurement System for Systematic Hydrological Characterization of Unsaturated Fractured Welded Tuff in a Mined Underground Tunnel. *Ground Water*, **41**: pp. 449-457, LBNL-48163.
15. Constantz, J., Cox, M.H. and Su, G.W., 2003. Comparison of Heat and Bromide as Ground Water Tracers Near Streams. *Ground Water*, **41**(5): pp. 647-656, LBNL-52974.
16. Dobson, P.F., Kneafsey, T.J., Hulen, J. and Simmons, A., 2003. Porosity, Permeability, and Fluid Flow in the Yellowstone Geothermal System, Wyoming. *Journal of Volcanology and Geothermal Research*, **123**(3-4): pp. 313-324, LBNL-50044.
17. Dobson, P.F., Kneafsey, T.J., Sonnenthal, E.L., Spycher, N. and Apps, J.A., 2003. Experimental and Numerical Simulation of Dissolution and Precipitation: Implications for Fracture Sealing at Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**: pp. 459-476, LBNL-48872.
18. Dobson, P., Salah, S., Spycher, N. and Sonnenthal, E., 2004. Simulation of Water-Rock Interaction in the Yellowstone Geothermal System Using TOUGHREACT. *Geothermics*, **33**(4): pp. 493-502, LBNL-52550
19. Doughty, C., Salve, R. and Wang, J.S.Y., 2002. Liquid-Release Tests in Unsaturated Fractured Welded Tuffs: II. Numerical Modeling. *Journal of Hydrology*, **256**(1-2): pp. 80-105, LBNL-47530.
20. Doughty, C. and C.-F. Tsang, 2005. Signatures in Flowing Wellbore Electrical-Conductivity Logs, *Journal of Hydrology*, LBNL-51468. (In Press)
21. Doughty, C. and Karasaki, K., 2002. Flow and Transport in Hierarchically Fractured Rock. *Journal of Hydrology*, **263**(1-4): pp. 1-22, LBNL-47030.
22. Doughty, C. and Pruess, K., 2004. Modeling Supercritical Carbon Dioxide Injection in Heterogeneous Porous Media. *Vadose Zone Journal*, **3**(3): pp. 837-847, LBNL-52527.
23. Doughty, C., Takeuchi, S., Amano, K., Shimo, M. and Tsang, C.-F., 2004. Application of

- Multi-rate Flowing Fluid Electric Conductivity Logging Method to Well DH-2, Tono Site, Japan. *Water Resources Research*: LBNL-56479. (Submitted 2004)
24. Engelhardt, I., Finsterle, S. and Hofstee, C., 2003. Experimental and Numerical Investigation of Flow Phenomena in Nonisothermal, Variably Saturated Bentonite/Crushed Rock Mixtures. *Vadose Zone Journal*, **2**(3): pp. 239-246, LBNL-52838.
 25. Engelhardt, I. and Finsterle, S., 2003. Thermal-Hydrologic Experiments with Bentonite/Crushed Rock Mixtures and Estimation of Effective Parameters by Inverse Modeling. *Applied Clay Science*, **23**(1-4): pp. 111-120, LBNL-52837.
 26. Faybishenko, B., Bodvarsson, G.S. and Salve, R., 2003. On the Physics of Unstable Infiltration, Seepage, and Gravity Drainage in Partially Saturated Tuffs. *Journal of Contaminant Hydrology*, **62 and 63**(Special Issue SI): pp. 63-87, LBNL-49864.
 27. Faybishenko, B., 2002. Chaotic Dynamics in Flow Through Unsaturated Fractured Media. *Advances in Water Resources*, **25**(7): pp. 793-816, LBNL-46958.
 28. Faybishenko, B., Young, A.L., Baryakhtar, V.G., Taboas, A.L. and Habegger, L., 2003. Reflections on the Chernobyl Accident and the Future of Nuclear Power. *Environmental Science & Technology (Special Issue 1)*: pp. 3-12, LBNL-54152.
 29. Faybishenko, B., 2004. Nonlinear Dynamics in Flow through Unsaturated Fractured-Porous Media: status and perspectives. *Reviews of Geophysics*, **42**(2): pp. DOI: 10.1029/2003RG000125, LBNL-51779.
 30. Finsterle, S., Fabryka-Martin, J.T. and Wang, J.S.Y., 2002. Migration of a Water Pulse through Fractured Porous Media. *Journal of Contaminant Hydrology*, **54**(1-2): pp. 37-57, LBNL-46747.
 31. Finsterle, S., Ahlers, C.F., Trautz, R.C. and Cook, P.J., 2003. Inverse and Predictive Modeling of Seepage Into Underground Openings. *Journal of Contaminant Hydrology*, **62-63**: pp. 89-109, LBNL-48914.
 32. Finsterle, S. and Oldenburg, C.M., 2004. Perface: Research Advances in Vadose Zone Hydrology through Simulations with the TOUGH Codes. *Vadose Zone Journal*, **3**(3): pp. 737, LBNL-55814.
 33. Finsterle, S., 2004. Multiphase Inverse Modeling: Review and iTOUGH2 Applications. *Vadose Zone Journal*, **3**: pp. 747-762, LBNL-54358.
 34. Finsterle, S., 2004. Demonstration of Optimization Techniques for Groundwater Plume Remediation using iTOUGH2. *Environmental Modeling and Software*: LBNL-56624. (Submitted 2004)
 35. Flint, A.L., Flint, L.E., Kwicklis, E.M., Fabryka-Martin, J.T. and Bodvarsson, G.S., 2002. Estimating Recharge at Yucca Mountain, Nevada, USA: Comparison of Methods.

- Hydrogeology Journal*, **10**(1): pp. 180-204, LBNL-55006.
36. Freifeld, B.M., Kneafsey, T.J. and Rack, F., 2004. On-Site Geologic Core Analysis Using a Portable X-ray Computed Tomographic System. *Journal of the Geological Society*: LBNL-55698. (Submitted 2004)
 37. Gallagher, P.M. and Finsterle, S., 2004. Physical and Numerical Model of Colloidal Silica Injection for Passive Site Stabilization. *Vadose Zone Journal*, **3**: pp. 917-925, LBNL-54364.
 38. Garrido, F., Illera, V., Campbell, C.G. and García-González, M.T., 2004. Regulating Cd, Cu, and Pb Mobility in an Acid Soil using Phosphogypsum, Sugar Foam, and Phosphoric Rock Amendments. *Journal of Environmental Quality*: LBNL-54566. (Submitted 2004)
 39. Ghezzehei, T.A., Trautz, R.C., Finsterle, S., Cook, P.J. and Ahlers, C.F., 2004. Modeling Coupled Evaporation and Seepage in Ventilated Tunnels. *Vadose Zone Journal*, **3**: pp. 806-818, LBNL-53857.
 40. Ghezzehei, T.A., 2004. Constraints on Flow Regimes in Wide-Aperture Fractures. *Water Resources Research*, **40**(11); W11503): pp. DOI: 10.1029/204WR003164, LBNL-54681.
 41. Haukwa, C.B., Tsang, Y.W., Wu, Y.-S. and Bodvarsson, G.S., 2003. Effect of Heterogeneity in Fracture Permeability on the Potential for Liquid Seepage into a Heated Emplacement Drift of the Potential Repository. *Journal of Contaminant Hydrology*, **62-63** (Special Issue SI): pp. 509-527, LBNL-51355.
 42. Haukwa, C.B., Wu, Y.S. and Bodvarsson, G.S., 2003. Modeling thermal-hydrological response of the unsaturated zone at Yucca Mountain, Nevada, to thermal load at a potential repository. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 529-552, LBNL-49950.
 43. Hickman, R.G., Dobson, P.F., van Gerven, M., Sagala, B. and Gunderson, R.P., 2004. Tectonic and stratigraphic evolution of the Sarulla graben geothermal area, North Sumatra, Indonesia. *Journal of Asian Earth Sciences*, **23**(3): pp. 435-448, LBNL-51196.
 44. Houseworth, J.E., Finsterle, S. and Bodvarsson, G.S., 2003. Flow and Transport in the Drift Shadow in a Dual-Continuum Model. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 133-156, LBNL-49868.
 45. Houseworth, J.E., 2004. An Analytical Model for Solute Transport in Unsaturated Flow through a Single Fracture and Porous Rock Matrix. *Water Resources Research*: LBNL-56342. (Submitted 2004)
 46. Hu, M.Q., Kneafsey, T.J., Trautz, R.C. and Wang, J.S.Y., 2002. Tracer Penetration into Welded Tuff Matrix from the Flowing Fracture. *Vadose Zone Journal*, **1**(1): pp.

- 102-112, LBNL-46400.
47. Hu, Q., Kneafsey, T.J., Roberts, J.J., Tomutsa, L. and Wang, J., 2004. Characterizing Unsaturated Diffusion in Porous Tuff Gravel. *Vadose Zone Journal*, **3**(4): pp. 1425-1438, LBNL-51504.
48. Hu, Q.M., Trautz, R.C. and Wang, J.S.Y., 2004. Tracer Migration Experiments in Unsaturated Fractured Tuff. *Geochemical Journal*, **38**(2): pp. 177-189, LBNL-45278.
49. Ito, K., Karasaki, K., Hatanaka, K.-i. and Masahiro, U., 2004. Hydrogeological Characterization of Sedimentary Rocks with Numerical Inversion using Steady-State Hydraulic Head Data - An Application to Horonobe Site. *Journal of Japan Society of Engineering Geology*, **45**(3): pp. 125-134, LBNL-53760.
50. Jin, G., Patzek, T.W. and Silin, D.B., 2004. Reconstruction of Sedimentary Rock Based on Mechanical Properties. *SPE Reservoir Evaluation Journal*: LBNL-55038. (Submitted 2004)
51. Juanes, R. and Patzek, T., 2004. Analytical Solution to the Riemann Problem of Three-Phase Flow in Porous Media. *Transport in Porous Media*, **55**(1): pp. 47-70, LBNL-51558.
52. Juanes, R. and Patzek, T., 2004. Relative Permeabilities for Strictly Hyperbolic Models of Three-phase flow in Porous Media. *Transport in Porous Media*, **57**(2): pp. 125-152, LBNL-51442.
53. Juanes, R. and Patzek, T.W., 2004. Multiscale-Stabilized Finite Element Methods for Miscible And Immiscible Flow in Porous Media. *Journal of Hydraulic Research*, **42**(Special Issue SI): pp. 131-140, LBNL-50382.
54. Juanes, R. and Patzek, T.W., 2004. Multiscale-Stabilized Solutions to One-Dimensional Systems of Conservation Laws. *Computer Methods in Applied Mechanics and Engineering*: LBNL-56670. (Submitted 2004)
55. Karasaki, K., 2003. Renewable Portfolio Standard and Geothermal Energy. *Geothermal Energy*, **28**(4): pp. 362-367, LBNL-53766.
56. Karasaki, K., 2002. Rethinking Geothermal Energy as a Renewable Energy Source (1). *Geothermal Energy*, **27**(2): pp. 98, LBNL-51374.
57. Karasaki, K., 2002. Rethinking Geothermal Energy as a Renewable Energy Source (2). *Geothermal Energy*, **27**(3): pp. No. 99, LBNL-51375.
58. Kim, J. and Corapcioglu, M.Y., 2002. Sharp-Interface Modeling of LNAPL Sources Migrating on the Water Table. *Environmental Engineering Science*, **18**(6): pp. 359-367, LBNL-50294.

59. Kim, J., Schwartz, F.W., Xu, T., Choi, H. and Kim, I.S., 2004. Coupled Processes of Fluid Flow, Solute Transport, and Geochemical Reactions in Reactive Barriers. *Vadose Zone*, **3**(3): pp. 867-874, LBNL-56507.
60. Kitamura, Y., Sato, K., Ikesawa, E., Ikebara-Ohmori, K., Kimura, G., Kondo, H., Ujiie, K., Onishi, C.T., Kawabata, K., Hashimoto, Y., Mukoyoshi, H. and Masago, H., 2004. Mélange and its Seismogenic Roof Thrust: A Plate Boundary Fault Rock in the Subduction Zone - An Example from the Shimanto Belt, Japan-. *Tectonics*: LBNL-55776. (Submitted 2004)
61. Kiryukhin, A., Xu, T., Pruess, K., Apps, J. and Slovtsov, I., 2004. Thermal-Hydrodynamic-Chemical (THC) Modeling Based on Geothermal Field Data. *Geothermics*, **33**(3): pp. 349-381, LBNL-55514.
62. Kitterød, N.-O. and Finsterle, S., 2004. Simulating Unsaturated Flow Fields Based on Saturation Measurements. *Journal of Hydraulic Research*, **42**: pp. 121-129, LBNL-54204.
63. Kneafsey, T.J. and Hunt, J.R., 2004. Non-Aqueous Phase Liquid Spreading During Soil Vapor Extraction. *Journal of Contaminant Hydrology*, **68**(3-4): pp. 143-164, LBNL-46519.
64. Korneev, V.A., Goloshubin, G.M., Daley, T.M. and Silin, D.B., 2004. Seismic Low-Frequency Effects in Monitoring of Fluid-Saturated Reservoirs. *Geophysics*, **69**(2): pp. 522-532, LBNL-48525.
65. Kovscek, A.R. and Radke, C.J., 2003. Pressure Driven Capillary Snap-Off of Gas Bubbles at Low Wetting Liquid Content. *Colloids and Surfaces A - Physicochemical and Engineering Aspects*, **212**(2-3): pp. 99-108, LBNL-55008.
66. Kowalsky, M.B., Finsterle, S. and Rubin, Y., 2004. Estimating Flow Parameter Distributions Using Ground-Penetrating Radar and Hydrological Measurements During Transient Flow in the Vadose Zone. *Advances in Water Resources*, **27**(6): pp. 583-599, LBNL-53786.
67. Lee, E.-S., Seol, Y., Fang, Y.C. and Schwartz, F.W., 2003. Destruction Efficiencies and Dynamics of Reaction Fronts Associated with the Permanganate Oxidation of Chloroethylene. *Environmental Science & Technology*, **37**(11): pp. 2540-2546; DOI: 10.1021/es0261731, LBNL-52163.
68. Lewicki, J.L., Connor, C., St-Amand, K., Stix, J. and Spinner, W., 2003. Self-Potential, Soil CO₂ Flux, and Temperature on Masaya Volcano, Nicaragua. *Geophysical Research Letters*, **30**(15): pp. 1817; DOI: 10.1029/2003GL017731, LBNL-56066.
69. Lewicki, J.L., Bergfeld, D., Cardellini, C., Chiodini, G., Granieri, D., Varley, N. and Werner, C., 2004. Comparative Soil CO₂ Flux Measurements and Geostatistical Estimation Methods on Masaya Volcano, Nicaragua. *Bulletin of Volcanology*: LBNL-54976. (In Press 2005)

70. Li, G. and Tsang, C.-F., 2003. Seepage into Drifts with Mechanical Degradation. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 157-172, LBNL-49869.
71. Lichtner, P.C., Yabusaki, S., Pruess, K. and Steefel, C.I., 2004. Role of Competitive Cation Exchange on Chromatographic Displacement of Cesium in the Vadose Zone beneath the Hanford S/SX Tank Farm. *Vadose Zone Journal*, **3**(1): pp. 203-219, LBNL-55515.
72. Liu, H.-H., Bodvarsson, G.S. and Pan, L., 2002. Determination of Particle Transfer in Random Walk Particle Methods for Fractured Porous Media. *Water Resources Research*, **36**(3): pp. 707-713, LBNL-43358.
73. Lippmann, M., 2004. Electrical Systems and Geothermal Development in the Central American Isthmus. *Geothermal Resources Council Trans*, v. **26**: pp. 37-42, LBNL-51844.
74. Lippmann, M., Truesdell, A.H., Rodriguez, M.H. and Perez, A., 2004. Response of Cerro Prieto II and III to Exploitation. *Geothermal*, **33**(3): pp. 229-256, LBNL-51748.
75. Liu, H.H. and Bodvarsson, G.S., 2003. Upscaling of constitutive Relations in Unsaturated Heterogeneous Porous Media with Large Air Entry Values. *Journal of Hydrology*, **276**: pp. 198-209, LBNL-47237.
76. Liu, H.H., Bodvarsson, G.S. and Pan, L., 2002. Reply to "Comment on 'Determination of Particle Transfer in Random Walk Particle Methods for Fractured Porous Media' by H.H. Liu et al. *Water Resources Research*, **38**(11): pp. 1222; doi: 10.1029/2002WR001568, LBNL-49008.
77. Liu, H.H., Bodvarsson, G.S. and Finsterle, S., 2002. A Note on Unsaturated Flow in Two-Dimensional Fracture Networks. *Water Resources Research*, **38**(9): pp. 1176; 10.1029/2001WR000977, LBNL-48970.
78. Liu, H.-H., Bodvarsson, G.S., Lu, S. and Molz, F.J., 2004. A Corrected and Generalized Successive Random Additions Algorithm for Simulating Fractional Levy Motions. *Mathematical Geology*, **36**(3): pp. 379-397, LBNL-50448.
79. Liu, H.-H., Haukwa, C.B., Ahlers, C.F., Bodvarsson, G.S., Flint, A.L. and Guertal, W.B., 2003. Modeling Flow And Transport in Unsaturated Fractured Rock: An Evaluation of the Continuum Approach. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 173-188, LBNL-51621.
80. Liu, H.-H., 2004. A Constitutive-Relationship Model for Film Flow on Rough Fracture Surfaces. *Hydrogeology Journal*, **12**(2): pp. 237-240; DOI: 10.1007/s10040-003-0297-x, LBNL-51201.
81. Liu, J., Bodvarsson, G.S. and Wu, Y.-S., 2003. Analysis of Flow Behavior in Fractured Lithophysal Reservoirs. *Journal of Contaminant Hydrology*, **62-63**((Special Issue SI)): pp. 189-211, LBNL-49870.

82. Liu, H.-H., Salve, R., Wang, J.S.Y., Bodvarsson, G. and Hudson, D., 2004. Field Investigation into Unsaturated Flow and Transport in a Fault: Model Analyses. *Journal of Contaminant Hydrology*, **74**(1-4): pp. 39-59, LBNL-52823.
83. Liu, H.-H., Zhang, G. and Bodvarsson, G., 2003. The Active Fracture Model: Its Relation to Fractal Flow Patterns and a Further Evaluation Using Field Observations. *Vadose Zone*, **2**(2): pp. 259-269, LBNL-52822.
84. Liu, H.-H., Bodvarsson, G. and Zhang, G., 2004. Scale Dependency of the Effective Matrix Diffusion Coefficient. *Water Resources Research*, **3**(2): pp. 321-315, LBNL-52824.
85. Liu, Q., Shen, P. and Wu, Y.-S., 2004. Characterizing Two-Phase Flow Relative Permeabilities in Chemical Flooding Using a Pore-Scale Network Model. *Transport in Porous Media*: LBNL-54750. (Submitted 2004)
86. Malkovsky, V.I., Pek, A.A. and Tsang, C.-F., 2002. Dynamic Stabilization of Heat-Generating Liquid Waste Plume in Slope Aquifer. *Journal of Hydrology*, **258**(1-4): pp. 69-82, LBNL-45957.
87. Lu, G., Sonnenthal, E.L. and Bodvarsson, G.S., 2004. Extended Water Mixing Model for Source Quantification through Sample Leaching Data. *Journal of Applied Geochemistry*: pp., LBNL-54514. (Submitted 2004)
88. Lu, G. and Zheng, C., 2004. Natural Attenuation of Fuel Hydrocarbon Contaminants: Correlation of Biodegradation with Hydraulic Conductivity in a Field Case Study. *Advances in Earth Sciences*, **19**(3): pp. 403-408, LBNL-54783.
89. Lu, G. 2004. Novel direct propagation neural network and application to parameter estimation. *Computation*, LBNL-56485 (Submitted 2004).
90. Lu, S., Molz, F.J. and Liu, H.-H., 2003. An Efficient, Three-Dimensional, Anisotropic, Fractional Brownian Motion and Truncated Fractional Levy Motion Simulation Algorithm Based on Successive Random Additions. *Computer & Geosciences*, **29**(1): pp. 15-25, LBNL-52537.
91. Malkovsky V. I., A. A. Pek, C.-F. Tsang, 2002. Dynamic stabilization of heat-generating liquid waste plume in a sloping aquifer, *Journal of Hydrology*, **258**, pp. 69-82, LBNL-45957.
92. Mays, D.C., Faybishenko, B.A. and Finsterle, S., 2002. Information Entropy to Measure Temporal and Spatial Complexity of Unsaturated Flow in Heterogeneous Media - art. no. 1313. *Water Resources Research*, **38**(12): pp. 1313, LBNL-49181.
93. Millard, A., Rejeb, A., Chijimatsu, M., Jing, L., De Jonge, J., Kohlmeier, M., Nguyen, T.S., Rutqvist, J., Souley, M. and Sugita, Y., 2004. Numerical Study of the THM Effects on the Near-Field Safety of a Hypothetical Nuclear Waste Repository - BMT1 of the DECOVALEX III Project. Part 2: Effects of THM Coupling in

- Continuous and Homogeneous Rock. *International Journal of Rock Mechanics & Mining Sciences*: LBNL-55941. (In Press)
94. Miller, N.L., Jin, J. and Tsang, C.-F., 2004. Local Climate Sensitivity of the Three Gorges Dam. *Geophysical Research Letters*: LBNL-57135. (Submitted 2004)
95. Min, K.-B., Rutqvist, J., Tsang, C.-F. and Jing, L., 2005. Thermally Induced Mechanical and Permeability Changes Around a Nuclear Waste Repository – A Far-Field Study based on Equivalent Properties Determined by a Discrete Approach. *International Journal of Rock Mechanics & Mining Sciences*: LBNL-56323. (In Press)
96. Min, K.-B., Rutqvist, J., Tsang, C.-F. and Jing, L., 2004. Stress-Dependent Permeability of Fractured Rock Masses: A Numerical Study. *International Journal of Rock Mechanics & Mining Sciences*, **41**(7): pp. 1191-1210, LBNL-56062.
97. Moridis, G.J., 2002. Semianalytical Solutions of Radioactive or Reactive Solute Transport in Variably-Fractured Layered Media. *Water Resources Research*, **38**(12): pp. 1310, LBNL-45871.
98. Moridis, G.J., Collett, T.S., Dallimore, S.R., Satoh, T., Hancock, S. and Weatherhill, B., 2004. Numerical Studies of Gas Production from Several CH₄ Hydrate Zones at the Mallik Site, McKenzie Delta, Canada. *Journal of Petroleum Science and Engineering*: **43**(3-4): pp. 219-238, LBNL-50257.
99. Moridis, G.J., Hu, Q., Wu, Y.-S. and Bodvarsson, G.S., 2003. Preliminary 3-D Site-Scale Studies of Radioactive Colloid Transport in the Unsaturated Zone at Selected Yucca Mountain Locations. *Journal of Contaminant Hydrology*, **60**(3-4): pp. 251-286, LBNL-45876.
100. Mukhopadhyay, S. and Tsang, Y.W., 2002. Understanding the Anomalous Temperature Data from the Large Block Test at Yucca Mountain, Nevada. *Water Resources Research*, **38**(10): pp. 1210; 10.1029/2001WR001059, LBNL-49124.
101. Mukhopadhyay, S. and Tsang, Y., 2003. Estimation of Host Rock Thermal Conductivities Using the Temperature Data From the Drift Scale Test at Yucca Mountain, Nevada. *Water Resources Research*: LBNL-54102. (Submitted 2003)
102. Mukhopadhyay, S. and Tsang, Y.W., 2003. Uncertainties in Coupled Thermal-Hydrological Processes Associated with the Drift Scale Test at Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**: pp. 595-612, LBNL-49872.
103. Nakagawa, S. and Daley, T.M., 2004. Analytical Modeling of Wave Generation by the Borehole Orbital Vibrator Source. *Geophysics*: LBNL-55828. (Submitted 2004)
104. Narasimhan, T.N., 2004. Buckingham, (1907): An Appreciation. *Vadose Zone*: LBNL-56645. (Submitted 2004)
105. Narasimhan, T.N., 2003. Fick's Insights on Liquid Diffusion. *EOS: Transactions*: 84(44)

pp. 469, 474, LBNL-56502.

106. Oldenburg, C.M., Webb, S.W., Pruess, K. and Moridis, G.J., 2004. Mixing of Stably Stratified Gases in Subsurface Reservoirs: A Comparison of Diffusion Models. *Transport in Porous Media*, **54**(3): pp. 323-334, LBNL-51545.
107. Oldenburg, C.M., 2002. Foreword to the Special Issue on Strongly Coupled Density-Dependent Flow in Porous Media. *Transport in Porous Media*, **47**(2): pp. 123-124, LBNL-49076.
108. Oldenburg, C.M., 2002. Carbon Dioxide as cushion Gas for Natural Gas Storage. *Energy and Fuels*, **17**(1): pp. 240-246, LBNL-51053.
109. Oldenburg, C.M. and Unger, A.J.A., 2003. On leakage and Seepage from Geologic Carbon Sequestration Sites: Unsaturated Zone Attenuation. *Vadose Zone Journal*, **2**: pp. 287-296, LBNL-51928.
110. Oldenburg, C.M., Stevens, S.H. and Benson, S.M., 2004. Economic Feasibility of Carbon Sequestration with Enhanced Gas Recovery (CSEGR). *Energy*, **29**(9-10 Special Issue SI): pp. 1413-1422, LBNL-49762.
111. Oldenburg, C.M. and Unger, A.A., 2004. Coupled Vadose Zone and Atmospheric Surface-Layer Transport of CO₂ from Geologic Carbon Sequestration Sites. *Vadose Zone Journal*, **3**(3): pp. 848-857, LBNL-55510.
112. Onishi, C.T. and Shimizu, I., 2004. Visualization of Microcrack Anisotropy in Granite Affected by a Fault Zone, Using Confocal Laser Scanning Microscope. *Journal of Structural Geology*: LBNL-55625. (Submitted 2004)
113. Öhman, J., Niemi, A. and Tsang, C.-F., 2005. A Regional-Scale Particle-Tracking Method for Nonstationary Fractured Media. *Water Resources Research*: LBNL-56997. (Submitted 2005)
114. Pan, L. and Bodvarsson, G.S., 2002. Modeling Transport in Fractured Porous Media with the Random-Walk Particle Method: The Transient Activity Range and the Particle-Transfer Probability. *Water Resources Research*, **38**(6): pp. 1080, LBNL-48042.
115. Pan, L., Wu, Y.-S. and Zhang, K., 2004. A Modeling Study of Flow Diversion and Focusing in unsaturated Fractured Rocks. *Vadose Zone Journal*, **3**(2): pp. 233-246, LBNL-49274.
116. Paton, B.E., Baryakhtar, V.G., Prister, B.S. and Faybishenko, B., 2003. The Chernobyl Catastrophe in Ukraine: Causes of the Accident and Lessons Learned. *Environmental Science and Pollution Research (Special Issue 1)*: pp. 3-12, LBNL-54151.
117. Patzek, T.W., Silin, D.B., Benson, S.M. and Barenblatt, G.I., 2003. On Vertical Diffusion of Gases in a Horizontal Reservoir. *Transport in Porous Media*, **51**(2): pp. 141-156,

LBNL-48909.

118. Pozdniakov, S. and Tsang, C.-F., 2004. A Self-Consistent Approach for Calculating the Effective Hydraulic Conductivity of a Bimodal, Heterogeneous Medium. *Water Resources Research*, **40**(5): pp. W05105, LBNL-55620.
119. Pruess, K., T. Xu, J. Apps and J. García, 2003.. Numerical Modeling of Aquifer Disposal of CO₂, *SPE Journal*, **8**(1)pp. 49 - 60, LBNL-47135.
120. Pruess, K. and Garcia, J., 2002. Multiphase Flow Dynamics During CO₂ Disposal into Saline Aquifers. *Environmental Geology*, **42**(2-3): pp. 282-295, LBNL-46793.
121. Pruess, K., Yabusaki, S., Steefel, C. and Lichtner, P., 2002. Fluid Flow, Heat Transfer, and Solute Transport at Nuclear Waste Storage Tanks in the Hanford Vadose Zone. *Vadose Zone Journal*, **1**(1-2): pp. 68-88, LBNL-49215.
122. Pruess, K., 2002. Numerical Simulation of Multiphase Tracer Transport in Fractured Geothermal Reservoirs. *Geothermics*, **31**: pp. 475-499, LBNL-48657.
123. Pruess, K., 2004 Numerical Simulation of CO₂ Leakage from a Geologic Disposal Reservoir, Including Transitions from Super- to Sub-Critical Conditions, and Boiling of Liquid CO₂, *Soc. Pet. Eng. J.*, **9**(2), pp. 237 - 248. LBNL-52423.
124. Pruess, K., 2004. A Composite Medium Approximation for Unsaturated Flow in Layered Sediments, *J. Contam. Hydr.*, **70**(3-4), pp. 225-247, doi:10.1016/j.jconhyd.2003.09.007, LBNL-49609.
125. Pruess, K. and Xu, T., 2004. Numerical Simulation of Reactive Flow in Hot Aquifers. *Geothermics*, **33**(1-2): pp. 213-215, LBNL-55513.
126. Pruess, K., 2004. The Tough Codes - A Family of Simulation Tools for Multiphase Flow and Transport Processes in Permeable Media. *Vadose Zone Journal*, **3**(3): pp. 738-746, LBNL-53630.
127. Pruess, K., Garcia, J., Kovscek, T., Oldenburg, C., Rutqvist, J., Steefel, C. and Xu, T., 2004. Code Intercomparison Builds Confidence in Numerical Simulation Models for Geologic Disposal of CO₂. *Energy*, **29**(9-10): pp. 1431-1444, LBNL-52211.
128. Rutqvist, J. and Tsang, C.-F., 2002. A study of caprock hydromechanical changes associated with CO₂ injection into a brine formation. *Environmental Geology*, **42**(2-3): pp. 296-305, LBNL-48145.
129. Rutqvist, J., Wu, Y.-S., Tsang, C.-F. and Bodvarsson, G., 2002. Coupling of Thermal, Hydrologic, and Mechanical Codes for Analysis of Multiphase Fluid Flow, Heat Transfer, and Deformation in Fractured Porous Rock. (39) pp. 429-442, LBNL-48686.
130. Rutqvist, J. and Stephansson, O., 2003. The Role of Hydromechanical Coupling in

- Fractured Rock Engineering. *Hydrogeology Journal*, **11**: pp. 7-40, LBNL-52224.
131. Rutqvist, J., Wu, Y.-S., Tsang, C.-F. and Bodvarsson, G., 2002. A Modeling Approach for Analysis of Coupled Multiphase Fluid Flow, Heat Transfer, and Deformation in Fractured Porous Rock. *Int. Journal of Rock Mechanics and Mining Sciences*, **39**(4): pp. 429-442, LBNL-50138.
132. Rutqvist, J. and Tsang, C.-F., 2003. Analysis of Thermo-Hydro-Mechanical Conditions Near and Emplacement Drift at Yucca Mountain. *Journal of Contaminant Hydrology*, **62-3**(Special Issue SI): pp. 637-652, LBNL-49951.
133. Rutqvist, J., Barr, D., Datta, R., Gens, A., Millard, A., Olivella, S., Tsang, C.-F. and Tsang, Y., 2004. Coupled Thermal-Hydrological-Mechanical Analyses of the Yucca Mountain Drift Scale Test - Comparison of Field Measurements to Predictions of Four Different Numerical Models. *International Journal of Rock Mechanics & Mining Sciences*: LBNL-56267. (In Press)
134. Rutqvist, J., Chijimatsu, M., Jing, L., Millard, A., Nguyen, T.S., Rejeb, A., Sugita, Y. and Tsang, C.-F., 2004. Numerical Study of the THM Effects on the Near-Field Safety of a Hypothetical Nuclear Waste Repository - BMT1 of the DECOVALEX III Project. Part 3: Effects of THM Coupling in Sparsely Fractured Rocks. *International Journal of Rock Mechanics & Mining Sciences*: LBNL-56308. (Submitted 2004)
135. Saar, M.O. and Manga, M., 2003. Seismicity Induced by Seasonal Groundwater Recharge at Mt. Hood, Oregon. *Earth and Planetary Science Letter*, **214**(3-4): pp. 605-618, LBNL-53930.
136. Saar, M.O. and Manga, M., 2004. Depth Dependence of Permeability in the Oregon Cascades Inferred from Hydrogeologic, Thermal, Seismic, and Magmatic Modeling Constraints. *Journal of Geophysical Research-Solid Earth*, **109**(B4): pp., LBNL-54461.
137. Salve, R., Wang, J.S.Y. and Doughty, C., 2002. Liquid-Release Tests in Unsaturated Fractured Welded Tuffs: I Field Investigations. *Journal of Hydrology*, **256**(1-2): pp. 60-79, LBNL-50334.
138. Salve, R. and Tokunaga, T.K., 2002. Seepage Response Along an Alluvial Valley in a Semi-Arid Catchment in North-Central California. *Hydrological Processes*, **16**(1): pp. 65-86, LBNL-45845.
139. Salve, R., 2005. A Passive-Discrete Water Sampler for Monitoring Seepage. *Ground Water*, **43**(1): pp. 133-137, LBNL-51203.
140. Salve, R., 2002. An Automated Tunnel Evaporation Measurement System for Confined Spaces. *Hydrological Processes*, **16**: pp. 1101-1109, LBNL-48157.
141. Salve, R., Oldenburg, C.M. and Wang, J.S., 2003. In Situ Flow Experiments in

- Nonwelded Tuff: Conceptual Models and Implications for the Flow in the PTn. *Journal of Contaminant Hydrology*, **62-63**: pp. 269-286, LBNL-48869.
142. Salve, R., Liu, H.-H., Hu, Q., Hudson, D., Cook, P. and Czarnomski, A., 2004. Unsaturated Flow and Transport through A Fault Embedded in Fractured Welded Tuff. *Water Resources Research*, **40**(4; W04210): pp. DOI: 10.1029/2003WR002571, LBNL-53632.
143. Salve, R., 2004. Preferential Flow in Fractured Welded Tuffs. *Water Resources Research*: LBNL-56265. (Submitted 2004)
144. Salve, R. and Kneafsey, T.J., 2005. Vapor-Phase Transport in the Near-Drift Environment at Yucca Mountain. *Water Resources Research*, **41**: pp. doi:10.1029/2004WR003373, LBNL-55212.
145. Salve, R., Liu, H.-H., Wang, J.S.Y. and Hudson, D., 2005. Development of a Wet Plume Following Liquid Release Along a Fault. *Vadose Zone*, **4**: pp., LBNL-52711.
146. Seol, Y., Zhang, H. and Schwartz, F.W., 2003. A Review of In-Situ Chemical Oxidation and Heterogeneity. *Environmental and Engineering Geoscience*, **6**(1): pp. 39-51, LBNL-52146.
147. Seol, Y., Liu, H.H. and Bodvarsson, G.S., 2003. Effects of Dry Fractures on Matrix Diffusion in Unsaturated Fractured Rocks. *Geophysical Research Letters*, **30**(2): pp. 1075; 10.1029/2002GL016118, LBNL-49437.
148. Seol, Y., Kneafsey, T.J., Ito, K. and Finsterle, S., 2003. Numerical Simulations for the Design of Laboratory Experiments to Evaluate the Active Fracture Concept. *Vadose Zone*: LBNL-52818. (Submitted 2003)
149. Serrano, S., Garrido, F., Campbell, C.G. and García-González, M.T., 2005. Competitive Sorption of Cadmium and Lead in Acid Soils of Central Spain. *Geoderma*, **124**(1-2): pp. 91-104, LBNL-54510.
150. Shan, C. and Bodvarsson, G., 2004. An Analytical Solution for Estimating Percolation Rate by Fitting Temperature Profiles in the Vadose Zone. *Journal of Contaminant Hydrology*, **68**(1-2): pp. 83-95, LBNL-50458.
151. Shan, C. and Pruess, K., 2004. EOSN - A New TOUGH2 Module for Simulating Transport of Noble Gases in the Subsurface. *Geothermics*, **33**(4): pp. 521-529, LBNL-52431.
152. Shan, C. and Bodvarsson, G., 2004. An Analytical Solution for Estimating Percolation Rate by Fitting Temperature Profiles in the Vadose Zone. *Journal of Contaminant Hydrology*, **68**(1-2): pp. 83-95, LBNL-52351.
153. Shan, C. and Javandel, I., 2004. A Multilayered Box Model for Calculating Preliminary Remediation Goals in Soil Screening. *Risk Analysis*: LBNL-55492. (Submitted

2004)

154. Shan, C. and Pruess, K., 2005. An Analytical Solution for Slug-Tracer Tests in Fractured Reservoirs. *Water Resources Research*: LBNL-57285. (Submitted 2005)
155. Shen, P., Zhu, B., Li, Z.-B. and Wu, Y.-S., 2004. The Influence of Interfacial Tension on Water-Oil Two-Phase Relative Permeability. *Journal of Hydrology*: LBNL-55640. (Submitted 2004)
156. Shvidler, M. and Karasaki, K., 2005. Averaging of Stochastic Equations for Flow and Transport in Porous Media. *Transport in Porous Media*: LBNL-56935. (Submitted 2005)
157. Shvidler, M. and Karasaki, K., 2003. Exact Averaging of Stochastic Equations for Transport in random Fields. *Transport in Porous Media*, **50**: pp. 223-241, LBNL-46310.
158. Silin, D. and Patzek, T., 2004. On Barenblatt Model of Spontaneous Countercurrent Imbibition. *Transport in Porous Media*, **54**(3): pp. 297-322, LBNL-51373.
159. Silin, D.B. and Tsang, C.-F., 2002. Estimation of Formation Hydraulic Properties from Analysis of Regular Operations Data. *Journal of Hydrology*, **265**(1-4): pp. 1-14, LBNL-48543.
160. Silin, D.B. and Tsang, C.-F., 2002. Estimation of Formation Hydraulic Properties Accounting for Pre-Test Injection or Production Operations. *Journal of Hydrology*, **265**(1-4): pp. 1-14, LBNL-45079.
161. Silin, D.B., Korneev, V.A., Goloshubin, G.M. and Patzek, T.W., 2004. A Hydrologic approach to Biot's Theory of Poroelasticity. *Transport in Porous Media*: LBNL-54955. (Accepted 2005)
162. Silin, D.B. and Tsang, C.-F., 2003. A Well-Test Analysis Method Accounting for Pre-Test Operations. *SPE Journal*, **8**(1): pp. 22-31, LBNL-53012.
163. Sonnenthal, E., Xu, T. and Bodvarsson, G., 2005. Reply to "Commentary: Assessment of Past Infiltration Fluxes through Yucca Mountain on the Basis of the secondary Mineral Record-Is it a Viable Methodology?", by Y.V. Dublyansky and S.Z. Smirnov. *Journal of Containment Hydrology*, **77**(3), 225-231, LBNL-57290.
164. Sonnenthal E., A. Ito, N. Spycher, M. Yui, J. Apps, Y. Sugita, M. Conrad, and S. Kawakami, 2005, Approaches to modeling coupled thermal, hydrological, and chemical processes in the Drift Scale Heater Test at Yucca Mountain. *International Journal of Rock Mechanics and Mining Sciences*, LBNL-57343. (Submitted 2005)
165. Spycher, N., Pruess, K. and Ennis-King, J., 2003. CO₂-H₂O Mixtures in the Geologic Sequestration of CO₂. I. Assessment and Calculation of Mutual Solubilities from 12 to 100 Degrees C and up to 600 bar. *Geochimica et Cosmochimica Acta*, **67**(16):

- pp. 3015-3031, LBNL-50991.
166. Spycher, N. and Pruess, K., 2005. CO₂-H₂O Mixtures in the Geological Sequestration of CO₂. II. Partitioning in Chloride Brines at 12-100°C and up to 600 bar. *Geochimica et Cosmochimica Acta*: LBNL-56334. (In Press)
 167. Starzec, P. and Tsang, C.-F., 2002. Use of Fracture-Intersection Density for Predicting the Volume of Unstable Blocks in Underground Openings. *Int. Journal of Rock Mechanics and Mining Sciences*, **39**(6): pp. 807-813, LBNL-48475.
 168. Su, G.W., Geller, J.T., Hunt, J.R. and Pruess, K., 2004. Small-Scale Features of Gravity-Driven Flow in Unsaturated Fractures. *Vadose Zone Journal*, **3**(2): pp. 592-601, LBNL-50691.
 169. Su, G.W., Wang, J.S. and Zacny, K., 2004. *In situ* Freeze-Capturing of Fracture Water using Cryogenic Coring. *Vadose Zone* (3): pp. 1479-1482, LBNL-54466.
 170. Su, G.W., Nimmo, J.R. and Dragila, M.I., 2003. Effect of Isolated Fractures on Accelerated Flow in Unsaturated Porous Rock. *Water Resources Research*, **39**(12): pp. 1326; DOI: 10.1029/2002WR001691, LBNL-53788.
 171. Su, G.W., Jasperse, J., Seymour, D. and Constantz, J., 2004. Analysis of Temperature and Water Levels in Wells to Estimate Alluvial Aquifer Hydraulic Conductivities. *Ground Water*, **42**(6): pp. 890, LBNL-53167.
 172. Su, G.W., Freifeld, B.M., Oldenburg, C.M., Jordan, P.D. and Daley, P.F., 2005. Simulation of In-Situ Permeable Flow Sensors for Measuring Groundwater Velocity. *Ground Water*: LBNL-57084. (Submitted 2005)
 173. Su, G.W. and Javandel, I., 2004. DNAPL Invasion into a Partially Saturated Dead-End Fracture. *Vadose Zone*: LBNL-55535. (Submitted 2004)
 174. Todaka, N., Akasaka, C., Xu, T. and Pruess, K., 2004. Reactive Geothermal Transport Simulation to Study the Formation Mechanism of Impermeable Barrier between Acidic and Neutral Fluid Zones in the Onikobe Geothermal Field, Japan. *Journal of Geophysical Research*, **109**: pp. B05209, DOI: 10.1029/203JB002792, LBNL-52493 Jart.
 175. Todesco, M., Rutqvist, J., Chiodini, G., Pruess, K. and Oldenburg, C.M., 2004. Modeling of Recent Volcanic Episodes at Phleorean Fields (Italy): Geochemical Variations and Ground Deformation. *Geothermics*, **33**(4): pp. 531-547, LBNL-53603.
 176. Tokunaga, T.K., Wan, J., Hazen, T.C., Schwartz, E., Firestone, M.K., Sutton, S.R., Newville, M., Olson, K.R., Lanzirotti, A. and Rao, W., 2003. Distribution of Chromium Contamination and Microbial Activity in Soil Aggregates. *Journal of Environmental Quality*, **32**(2): pp. 541-549, LBNL-48562.
 177. Tokunaga, T.K., Wan, J. and Olson, K.R., 2002. Saturation-Matric Potential Relations in

- Gravel - Art. No. 1214. *Water Resources Research*, **32**(10): pp. 1242, LBNL-49644.
178. Tokunaga, T.K., Wan, J., and, Olson, K.R. 2003. Moisture Characteristics of Hanford Gravels: Bulk, Grain-Surface, and Intragranular Components. *Vadose Zone Journal*, **2**: pp. 322-329, LBNL-52691.
179. Tokunaga, T.K., Wan, J., Firestone, M.K., Hazen, T.C., Olson, K.R., Herman, D.J., Sutton, S.R. and Lanzirotti, A., 2003. In Situ Reduction of Chromium(VI) in heavily Contaminated Soils through Organic Carbon Amendment. *Journal of Environmental Quality*, **32**(5): pp. 1641-1649, LBNL-52528.
180. Tokunaga, T.K., Olson, K.R. and Wan, J., 2004. Conditions Necessary for Capillary Hysteresis in Porous Media: Tests of Grain size and Surface Tension Influences. *Water Resources Research*, **40**(5; W05111): pp. DOI: 10.1029/2003WR002908, LBNL-54911.
181. Tokunaga, T.K., Wan, J., Pena, J., Sutton, S.R. and Newville, M., 2004. Hexavalent Uranium Diffusion into Soils from Concentrated Acidic and Alkaline Solutions. *Environmental Science & Technology*, **38**(11): pp. 3056-3062; DOI: 10.1021/es035289+, LBNL-54910.
182. Trautz, R.C. and Wang, J.S.Y., 2002. Seepage Into an Underground Opening Constructed in Unsaturated Fractured Rock under Evaporative Conditions - Art. No. 1188. *Water Resources Research*, **38**(10): pp. 1188, LBNL-47006.
183. Tsang, C.-F., Benson, S.M., Kobelski, B. and Smith, R.E., 2002. Scientific Considerations Related to Regulations Development for CO₂ Sequestration in Brine Aquifers. *Environmental Geology*, **42**(2-3): pp. 275-281, LBNL-48477.
184. Tsang, C.-F. and Shestakov, V.M., 2002. Introduction to the Special Issue: "Subsurface Flow and Transport: From Theoretical Studies to Actions at Field Sites". *International Journal of Geosciences Environmental Geology*, **42**(2-3): pp. 125-126, DOI: 10.1007/s00254-001-0480-0, LBNL-53946.
185. Tsang, C.-F. and Doughty, C., 2003. A Particle-Tracking Approach to Simulating Transport in Complex Fracture. *Water Resources Research*, **39**(7): pp. 1174-1178; doi: 10.1029/2002WR001514, LBNL-50537.
186. Tsang, C.-F. and Doughty, C., 2003. Multirate Flowing Fluid Electric Conductivity Logging Method. *Water Resources Research*, **39**(12): pp. 1354; doi: 10.1029/2003WR002308, LBNL-52518.
187. Tsang, C.-F., Bernier, F. and Davies, C., 2005. Geohydromechanical Processes in the Excavation Damaged Zone in Crystalline Rock, Rock Salt, and Indurated and Plastic Clays. *International Journal of Rock Mechanics & Mining Sciences*, **42**(1): pp. 109-125, LBNL-55700.

188. Tsang, C.-F., 2005. Is Current Hydrogeologic Research Addressing Long-Term Predictions? *Ground Water*, **43**(3): pp., LBNL-56371.
189. Tsang, Y.W. and Bodvarsson, G.S., 2004. Yucca Mountain and the Thermal Design of the Repository. *Nature*: LBNL-56421. (Submitted 2004)
190. Unger, A.J.A., Faybishenko, B., Bodvarsson, G. and Simmons, A., 2004. Simulating Infiltration Tests in Fractured Basalt at the Box Canyon Site, Idaho. *Vadose Zone Journal*, **3**(2): pp. 75-89, LBNL-53047.
191. Unger, A.J.A., Finsterle, S. and Bodvarsson, G., 2004. Transport of Radon Gas into a Tunnel at Yucca Mountain - Estimating Large-Scale Fractured Tuff Hydraulic Properties and Implications for the Operation of the Ventilation System. *Journal of Contaminant Hydrology*, **70**(1-2): pp. 153-171, LBNL-52577.
192. Vasco, D., W., Karasaki, K. and Nakagome, O., 2002. Monitoring Reservoir Production using Surface Deformation at the Hijiori Test Site and the Okuizu Geothermal Field, Japan. *Geothermics*, **31**(3): pp. 303-342, LBNL-51174.
193. Vasco, D., Wicks, J., C., Karasaki, K. and Marques, O., 2002. Geodetic Imaging: High Resolution Reservoir Monitoring using Satellite Interferometry. *Geophysical Journal International*, **149**: pp. 555-571, LBNL-46464.
194. Wan, J. and Tokunaga, T.K., 2002. Partitioning of Clay Colloids at Air-Water Interfaces. *Journal of Colloid & Interface Science*, **247**(1): pp. 54-67, LBNL-49155.
195. Wan, J., Tokunaga, T.K., Larsen, J.T. and Serne, R.J., 2004. Geochemical Evolution of Highly Alkaline and Saline Tank Waste Plumes during Seepage Through Vadose Zone Sediments. *Geochimica et Cosmochimica Acta*, **68**(3): pp. 491-502; DOI: 10.1016/S0016-7037(00)00482-4, LBNL-55733.
196. Wan, J., Tokunaga, T.K., Salz, E., Larsen, J.T., Zheng, Z. and Courtore, R.A., 2004. Colloid Formation at Waste Plume Fronts. *Environmental Science & Technology*, **38**(22): pp. 6066-6073; DOI: 10.1021/es0492384, LBNL-56059.
197. Wan, J., Larsen, J.T., Tokunaga, T.K. and Zheng, Z., 2004. pH Neutralization and Zonation in Alkaline-Saline Tank Waste Plumes. *Environmental Science & Technology*, **38**(5): pp. 1321-1329; DOI: 10.1021/es034855y, LBNL-53646.
198. Wan, J., Tokunaga, T.K., Larson, J., Zheng, Z., Brodie, E., Wang, Z., Herman, D., Hazen, T.C., Firestone, M.K. and Sutton, S.R., 2004. Reoxidation of Bioreduced Uranium Under Reducing Conditions. *Nature*: LBNL-56058. (Submitted 2004)
199. Wang, J.S.Y. and Bodvarsson, G.S., 2003. Evolution of the Unsaturated Zone Testing at Yucca Mountain. *Journal of Contaminant Hydrology*, **62-63**: pp. 337-360, LBNL-49876.
200. Wardell, L.J., Delmelle, P., Fischer, T., Lewicki, J.L., Malavassi, E., Stix, J. and Strauch,

- W., 2003. Volcanic Gas Workshop Fosters International Focus on State of the Art Measurement Techniques. *EOS: (Transactions, American Geophysical Union)*, 84(47), 519, 2003, LBNL-53967.
201. Webb, S. and Pruess, K., 2003. The Use of Fick's law for Modeling trace gas diffusion in porous media. *Transport in Porous Media*, 51(3): pp. 327-341, LBNL-51363.
202. Wu, Y.S., Pan, L., Zhang, W. and Bodvarsson, G.S., 2002. Characterization of Flow and Transport Processes within the Unsaturated Zone of Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, 54(3-4): pp. 215-247, LBNL-46572.
203. Wu, Y.-S., Zhang, W., Pan, L., Hinds, J. and Bodvarsson, G.S., 2002. Modeling Capillary Barriers in Unsaturated Fractured Rock - art. no. 1253. *Water Resources Research*, 38(11): pp. 35-31/35-12, LBNL-46876.
204. Wu, Y.-S., 2002. An Approximate Analytical Solution for Non-Darcy Flow in Fractured Media. *Water Resources Research*, 38(3): pp. 5-1--5-7, LBNL-48197.
205. Wu, Y. S. and J. Liu, 2004. Integration of Perched Water and Chloride Data in Modeling Flow Processes within the Unsaturated Zone of Yucca Mountain, Nevada, *Journal of Hydraulic Research, International Association of Hydraulic Engineering and Research*, 42, pp.115-120, LBNL-48702.
206. Wu, Y.-S., Liu, H.H. and Bodvarsson, G.S., 2004. A Triple-Continuum Approach for Modeling Flow and Transport Processes in Fractured Rock. *Journal of Contaminant Hydrology*, 73(1-4): pp. 145-179, LBNL-48875.
207. Wu, Y.-S., 2002. Numerical simulation of Single-Phase & Multiphase non-Darcy flow in porous and fractured reservoirs. *Transport in Porous Media*, 49(2): pp. 209-240, LBNL-45855.
208. Wu, Y.-S. and Pan, L., 2003. Special Relative Permeability Functions with Analytical Solutions for Transient Flow into Unsaturated Rock Matrix. *Water Resources Research*, 39(4): pp. 1104; doi: 10.1029/2002WR001495, LBNL-50443.
209. Wu, Y.S., Zhang, K.N., Ding, C., Pruess, K., Elmroth, E. and Bodvarsson, G.S., 2002. An Efficient Parallel-Computing Method for Modeling Nonisothermal Multiphase Flow and Multicomponent Transport in Porous And Fractured Media. *Advances in Water Resources*, 25(3): pp. 243-261, LBNL-47937.
210. Wu, Y.-S. and Pan, L., 2004. An Analytical Solution for Transient Radial Flow through Unsaturated Fractured Porous Media. *Water Resources Research*: LBNL-54587. (Submitted 2004)
211. Wu, Y.-S., Lu, G., Zhang, K. and Bodvarsson, G.S., 2004. A Mountain-Scale Model for Characterizing Unsaturated Flow and Transport in Fractured Tuff of Yucca Mountain. *Vadose Zone*, 3(3): pp. 796-805, LBNL-52524 Jart.

212. Wu, Y.-S., Lu, G., Zhang, K., Pan, L. and Bodvarsson, G.S., 2003. Analyzing Flow Patterns in Unsaturated Fractured Rock of Yucca Mountain using an Integrated Modeling Approach. *Water Resources Research*: LBNL-54006. (Submitted 2003)
213. Wu, Y.-S., Pan, L. and Pruess, K., 2004. A Physically Based Approach for Modeling Multiphase Fracture-Matrix Interaction in Fractured Porous Media. *Advances in Water Resources*, **27**(9): pp. 875-887, LBNL-54749.
214. Xu, T., Apps, J.A. and Pruess, K., 2004. Numerical Simulation of CO₂ Disposal by Mineral Trapping In Deep Aquifers. *Applied Geochemistry*, **19**(6): pp. 917-936, LBNL-48399.
215. Xu, T., Sonnenthal, E. and Bodvarsson, G., 2003. A Reaction-Transport Model for Calcite Precipitation and Evaluation of Infiltration-Percolation Fluxes in Unsaturated Fractured Rock. *Journal of Contaminant Hydrology*, **64**(1-2): pp. 113-127, LBNL-48282.
216. Xu, T., Apps, J.A. and Pruess, K., 2003. Reactive Geochemical Transport Simulation to Study Mineral Trapping for CO₂ Disposal in Deep Arenaceous Formations. *Journal of Geophysical Research*, **108**(B2): pp. 2071; doi:10.1029/2002JB001979, LBNL-50089.
217. Xu, T., Ontoy, Y., Molling, P., Spycher, N., Parini, M. and Pruess, K., 2004. Reactive Transport Modeling of Injection Well Scaling and Acidizing at Tiwi Field, Philippines. *Geothermics*, **33**(4): pp. 477-491, LBNL-53991.
218. Xu, T., Apps, J.A. and Pruess, K., 2004. Mineral Sequestration of Carbon Dioxide in a Sandstone-Shale System. *Chemical Geology*: LBNL-55818. (Submitted 2004)
219. Xu, T., Sonnenthal, E., Spycher, N. and Pruess, K., 2004. TOUGHREACT: A Simulation Program for Non-isothermal Multiphase Reactive Geochemical Transport in Variably Saturated Geologic Media. *Computer & Geosciences*: LBNL-56740. (In Press)
220. Xu, T., 2004. CO₂ Geological Sequestration. *Encyclopedic Knowledge*, **307**(2), 34-35, 2005 LBNL-56644.
221. Zhang, G., Zheng, Z. and Wan, J., 2005. Modeling Reactive Geochemical Transport of Concentrated Aqueous Solutions, *Water Resources Research*: 41 W02018, doi:10.1029/2004WR003097. LBNL-54384.
222. Zhang, K. and Woodbury, A.D., 2002. An Krylov Finite Element Approach for Multi-Species Containment Transport in Discretely Fractured Porous Media. *Advances in Water Resources*, **25**(7): pp. 705-721, LBNL-54500.
223. Zhang, K., Wu, Y.-S. and Bodvarsson, G.S., 2003. Massively Parallel Computing Simulation of Fluid Flow in the Unsaturated Zone of Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**: pp. 381-399, LBNL-48883.

224. Zhang, K., Wu, Y.-S. and Bodvarsson, G.S., 2003. Parallel Computing Simulation of Fluid Flow in the Unsaturated Zone of Yucca Mountain, Nevada. *Journal of Contaminant Hydrology*, **62-63**(Special Issue SI): pp. 381-399, LBNL-54504.
225. Zhang, K., Wu, Y.-S., Bodvarsson, G.S. and Liu, H.-H., 2004. Flow Focusing in Unsaturated Fracture Networks: A numerical Investigation. *Vadose Zone Journal*, **3**(2): pp. 624-633, LBNL-52819.
226. Zhang, Y., Oldenburg, C.M. and Benson, S.M., 2004. Vadose Zone Remediation of Carbon Dioxide Leakage from Geologic Carbon Dioxide Sequestration Sites. *Vadose Zone*, **3**(3): pp. 858-866, LBNL-54680.
227. Zhang, Y. and Pinder, G., 2003. Latin Hypercube Lattice Samples Selection Strategy for Correlated Random Hydraulic Conductivity Fields. *Water Resources Research*, **39**(8): pp. 1226; doi: 10.1029/2002WR001822, LBNL-53043.
228. Zhang, Y., Pinder, G. and Herrera, G., 2003. Enabling Technology for the Least-Cost Design of Groundwater Quality Monitoring Networks. 2. Field application. *Water Resources Research*: LBNL-53044. (Resubmitted 2005)
229. Zhang, Y., Pinder, G. and Herrera, G., 2003. Enabling Technology for the Least-Cost Design of Groundwater Quality Monitoring Networks. 1. Methodology. *Water Resources Research*: LBNL-53046. (Submitted 2003)
230. Zheng, Z., Wan, J. and Tokunaga, T.K., 2004. Sodium Meta-Autunite Colloids: Synthesis, Characterization, Stability. *Journal of Colloid and Interface Sciences*: LBNL-54563. (Submitted 2004)
231. Zheng, Z. and Wan, J., 2003. Release of Contaminant U(VI) from Soils. *Radiochimica Acta*: LBNL-54564. (Submitted 2003)
232. Zheng, Z., Tokunaga, T.K. and Wan, J., 2003. Influence of Calcium Carbonate on U(VI) Sorption to Soils. *Environmental Science & Technology*, **37**(24): pp. 5603-5608; DOI: 10.1021/es0304897, LBNL-54565.
233. Zhou, Q., Liu, H.-H., Bodvarsson, G.S. and Oldenburg, C.M., 2003. Flow and Transport in Unsaturated Fractured Rock: Effects of Multiscale Heterogeneity of Hydrogeologic Properties. *Journal of Contaminant Hydrology*, **60**(1-2): pp. 1-30, LBNL-50503.
234. Zhou, Q., Birkholzer, J.T., Javandel, I. and Jordan, P.D., 2004. Modeling Three-Dimensional Groundwater Flow and Advective Contaminant Transport at a Heterogeneous Mountainous Site in Support of Remediation Strategy. *Vadose Zone*, **3**(3): pp. 884-900, LBNL-54318.
235. Zhou, Q., Bear, J. and Bensabat, J., 2004. Saltwater Upcoming and Decay Beneath a Well Pumping Above an Interface Zone. *Transport in Porous Media*: LBNL-55486. (Submitted 2004)